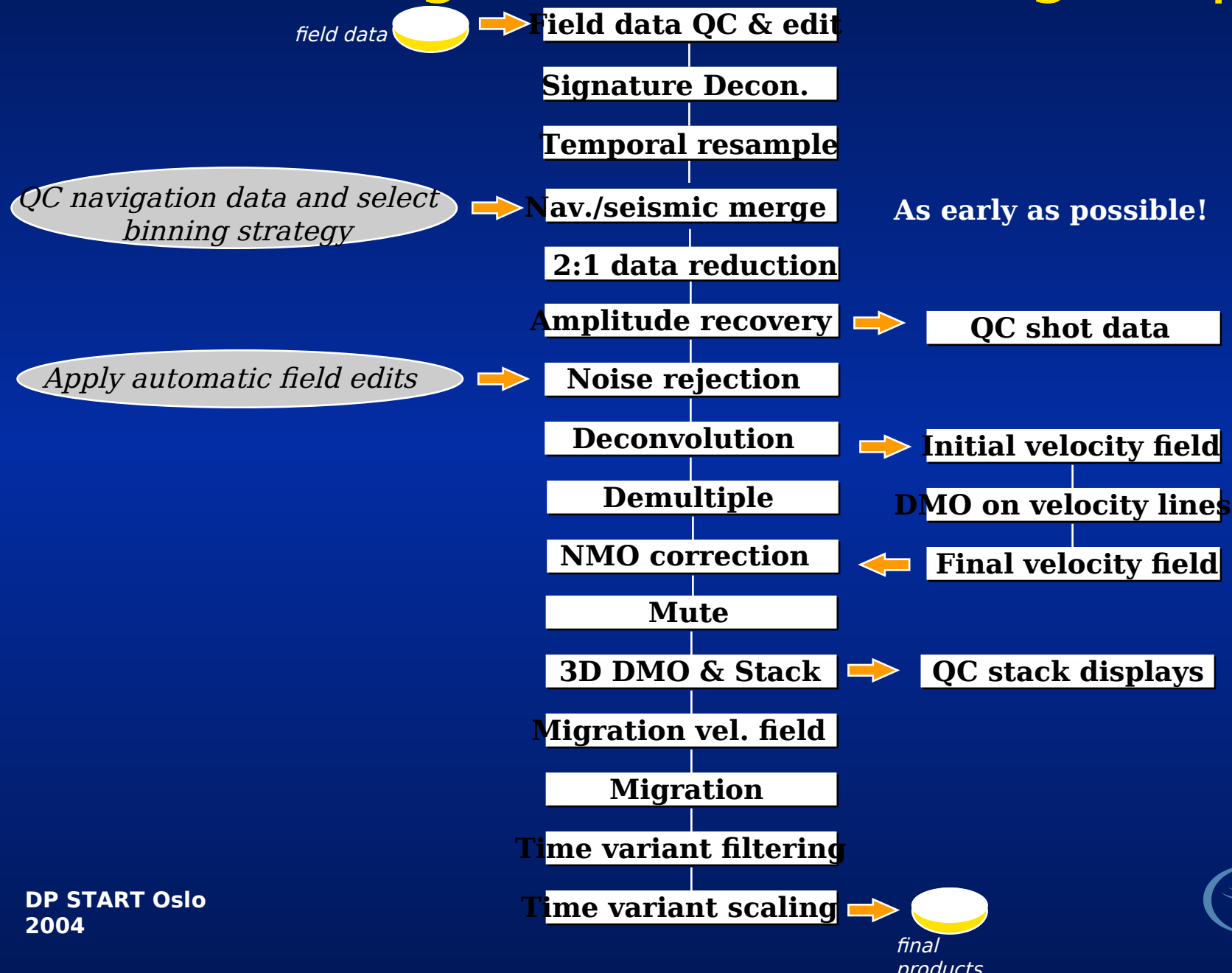


Parameter Testing

At the end of this Session, you will be able to:

- **Define the term "testing" as used in data processing.**
- **Describe at least 5 factors that can influence the choice of input data for a given testing plan.**
- **Define the term "testing plan" as used in data processing.**
- **Define the term "testing log" as used in data processing.**
- **Define the term "competitive trial testing" as used in data processing.**
- **Describe what information is needed before testing can begin.**
- **Define the term Regional Testing.**
- **Describe the convention for test numbering.**

Post Stack Migration Processing Sequence



Testing

So why does it take so long to apply 16 processes to a dataset?

Testing

Testing

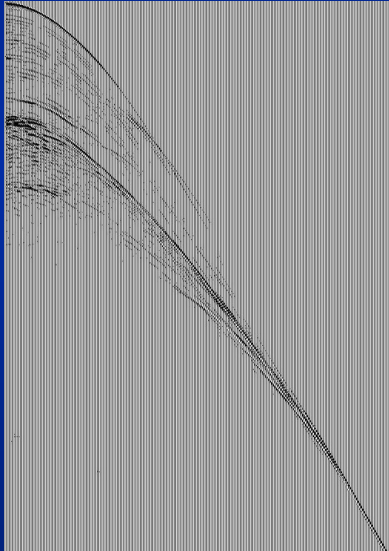
Testing is a logical sequence of discrete jobs designed to provide the optimum parameters to apply to all data in a seismic survey.

Parameters are tested on a predefined testing area, and decisions on the choice of parameters for production are made based on the results of these tests.

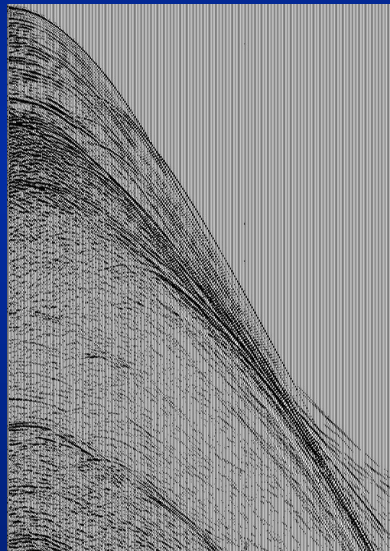
Amplitude Recovery Testing

Gain tests and outcomes:

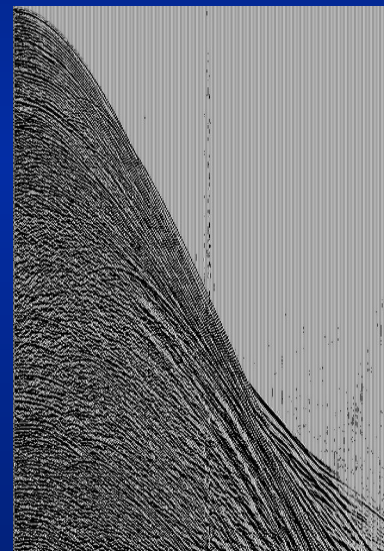
No Gain Applied



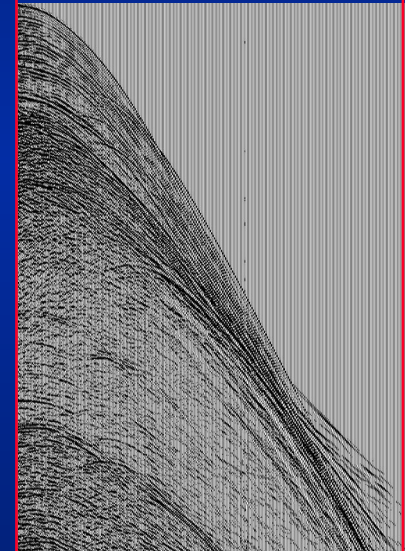
Expo Gain of 5



Expo Gain of 10



Time Function gain T^2



The Gain Applied in the
rest of the
processing

Testing Area

Its very important that the data chosen for testing is representative of the entire dataset. Factors influencing the choice of input data for testing includes

- **Target zone for the survey**
- **Client Objectives**
- **Time Frame for testing**
- **The Objective of the testing plan**
- **Data character (if testing for swell noise removal it must contain some swell noise)**

Testplan

Testplan- The plan setting out which parameter tests will be run for a particular project and how that parameter testing will be managed.

Testing Plan		
Plan No:	Estimated Completion Date:	
Client:	Area:	Proposal No.
Line No(s):	Shotpoint Range(s):	CMP Range(s):
Description & Objectives		
The objective is 1) Title Text 2) Title Text		
Prepared by:		Position:

Testlog

Testlog- is a record of all parameter test jobs for a project and their status.

[illegible]

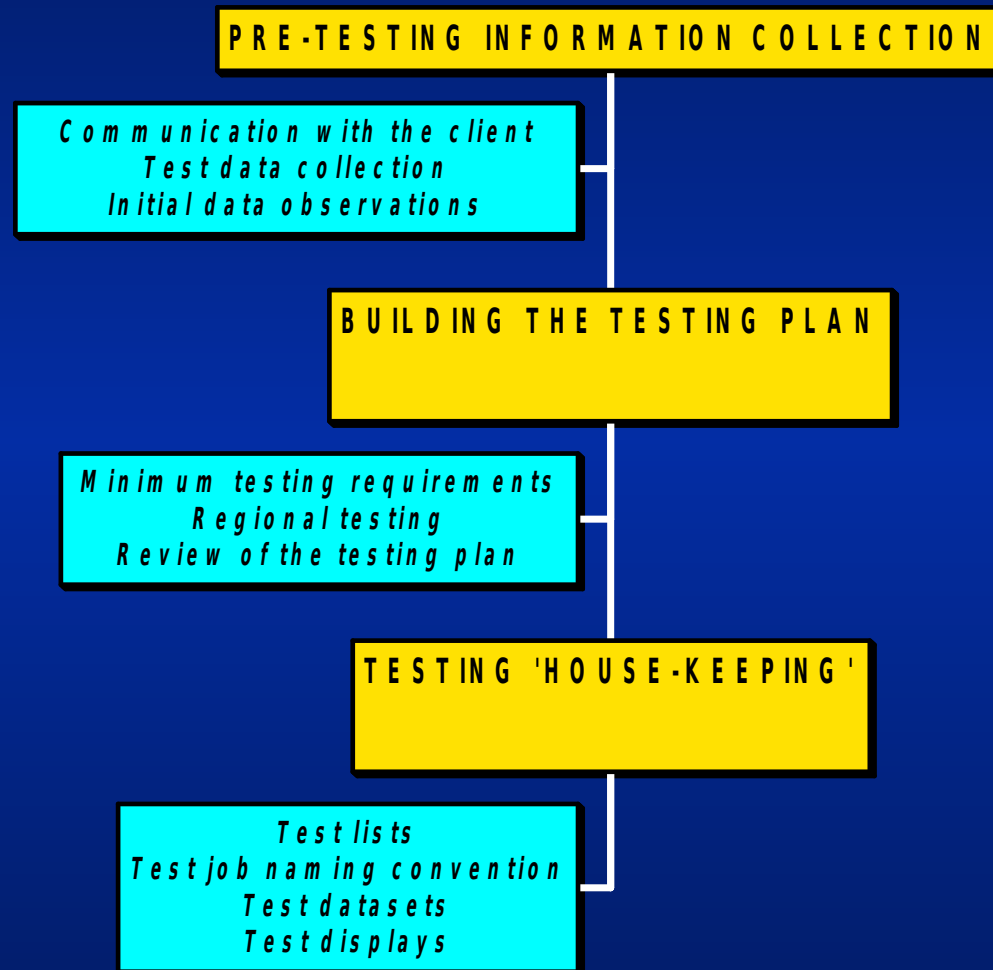
Competitive Trial Testing

This is where a number of companies are given the chance to perform a suite of tests on a clients dataset. After the trial 1 company is chosen to process the data based on the quality of their results and how quickly they can deliver the final product.

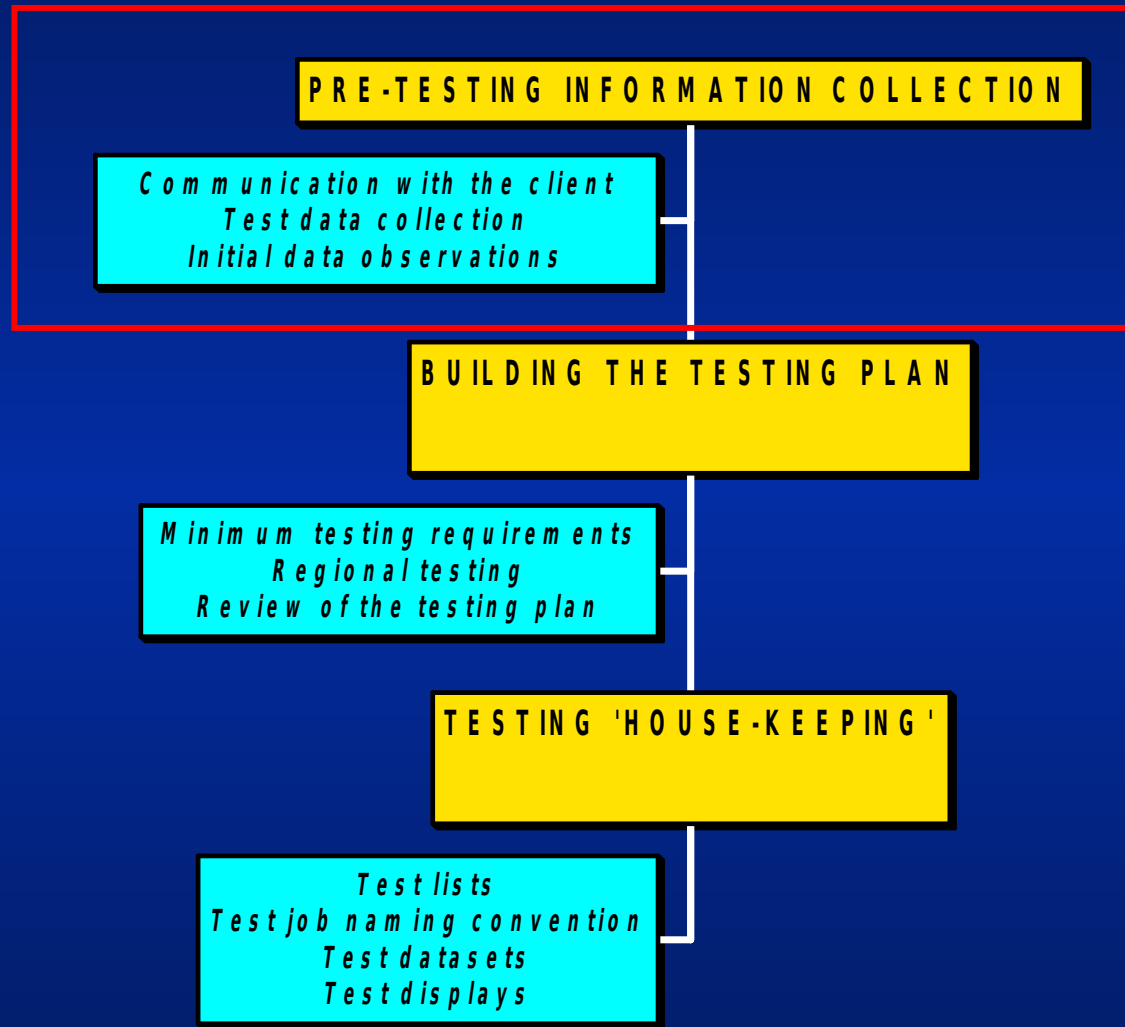
The Testing Lifecycle

- ☐ *Pre-Testing Information Collection*
- ☐ *Building The Testing Plan*
- ☐ *Testing 'House Keeping'*

Testing Flowchart



Pre-Testing Information Collection



Pre-Testing Information Collection

- *Communication With The Client*

‘Clearly understand what the clients objectives are for the project to be tested’

Communication With The Client

- **Discuss what the aims / goals are of the project.**
- **Obtain an understanding of the geological targets and sequence for the area to be processed.**
- **Obtain the correct 3D sail line or 2D line to test. Other lines may also be included for testing, to be used for test confirmation purposes. This may be especially necessary if the survey is particularly large or if there is a pronounced change in geology and/or water depth.**
- **Does the complete length of the test line need to be tested, or will a sub-set of it suffice?**

Communication With The Client

- **The client is there to help, and so should be regarded as an ally and not an adversary. Most of the time they bring a wealth of experience with them which will often be pertinent to the survey to be tested. Their suggestions should therefore be heeded.**
- **Remember however, that WesternGeco also has a wealth of processing experience, so the onus is on us to suggest processes that the client may not have considered, or indeed is aware of.**

Pre-Testing Information Collection

■ *Test Data Collection*

‘Do you have all the relevant information in order to initiate testing?’

Test Data Collection

- Obtain the re-formatted test line(s) at the recorded sampling interval.
- For 3D data, obtain the navigation data so that true offsets and X/Y coordinates may be assigned. For 2D test data, assigning nominal offsets and X/Y coordinates may suffice.
- Read and understand the observers logs and other relevant paperwork, so that parameters such as the shot interval, group interval, number of groups, number of cables, gun timing delay Etc, may be accounted for during processing.
- If tidal statics are to be applied, ensure that the tide tables are obtained as soon as possible.

Test Data Collection

- Obtain the source signature. Deterministic signature deconvolution and/or model based wavelet processing may be required.
- Is there any existing velocity control for the survey area which the client can supply? This information may be helpful in creating a brute velocity field for the survey.

Pre-Testing Information Collection

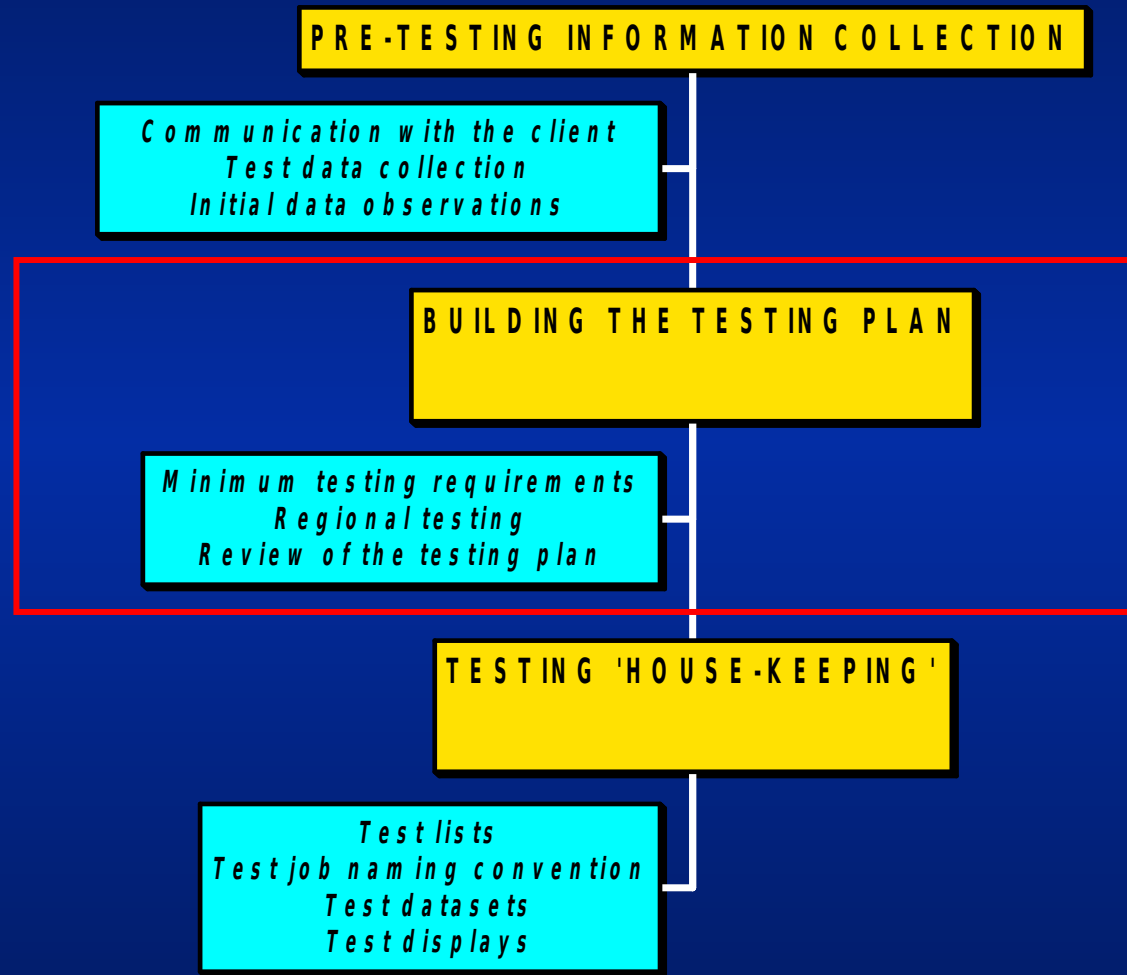
- ***Initial Data Observations***

‘Initial observations made of the dataset to be processed will help to formulate aspects of the testing plan’

Initial Data Observations

- A 'first look' at raw shots, near trace displays, brute stacks Etc, may enable a judgement on what processes are likely to be effective.
- What major problems does the seismic data exhibit? For example; strong multiple contamination, poor signal to noise ratio, coherent noise contamination, marine statics Etc.

Building The Testing Plan



Building The Testing Plan

- ***Minimum Testing Requirements***

‘Clients should be able to specify the range and amount of testing that they would like to see. This should be treated as your minimum!’

Minimum Testing Requirements

- If one exists, read carefully the requirements for testing in the contract or scope of work. Construct your testing plan using this as a minimum requirement. There is always room for us to offer other processes that the client has not considered or is aware of.

Building The Testing Plan

■ *Regional Testing*

‘Seismic data acquired in various regions of the world can exhibit different characteristics. Past experience will suggest what processes are likely to be effective’

Regional Testing

- **Our own experience confirms that seismic data acquired in different areas of the world can exhibit different properties and hence different processing challenges. This is likely to be mainly due to changes in geology, but may also for example be related to variations in the water depth. Past experience will suggest what processes are likely to be effective for the survey in question.**
- **Similar data may already have been processed in the department or at other sites. Try to find out what processes were previously tested (and chosen) before, along with any problems encountered.**

Building The Testing Plan

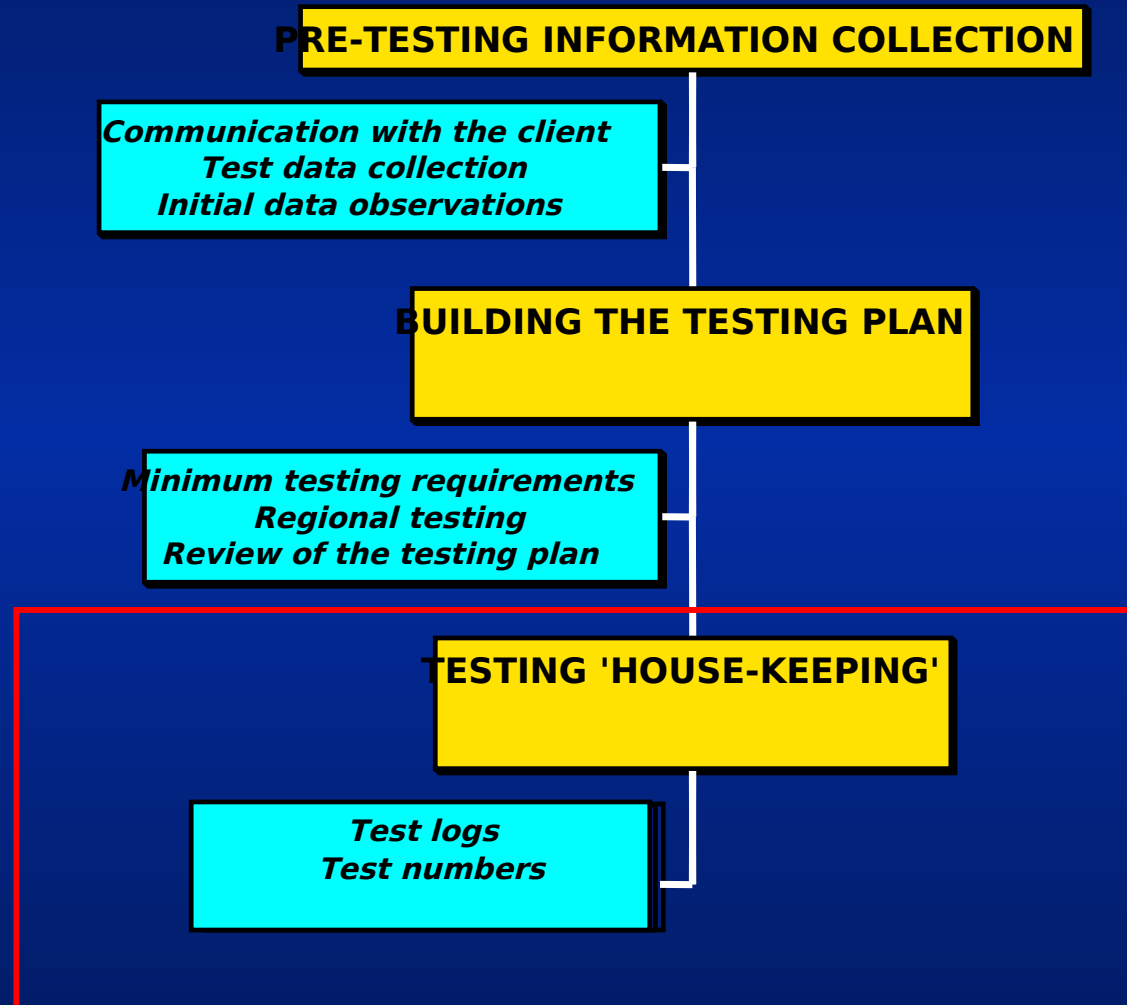
- *Review Of The Testing Plan*

‘Review the proposed testing plan with the client, in order to obtain the ‘go-ahead’ to start testing’

Review Of The Testing Plan

- Review the designed testing plan with the client. You may wish to initially consider prestack test processes first and leave the post stack and post migration processes until later.
- All testing plans should be stored on the '*SuperVISION*' project website.

Testing 'House-Keeping'



Testing 'House-Keeping'

- ***Test Logs***

'Test logs should always be kept up to date, and are the key to controlling your testing'

Test Logs

- The creation of a test log is a fundamental part of good test processing. This log should always be kept up to date, and reside in the project admin directory and the *'SuperVISION'* website.
- Assigning a specific test number to a particular process enables testing to be performed in an orderly manner. It is also very QA friendly, as the job that created the particular test plot or dataset may be easily tracked using the test numbering scheme.
- Let's see how this works...

Test Logs

- Here is an example of how the 'full' test number may be built:

Test Number : 1712 - 101 - 001

1712; refers to the line used for testing

101; refers to the process being tested

001; refers to the individual test being run for that process

Test Numbers

- The following three slides show abridged versions of the tables containing the test process codes for prestack, post stack and post migration tests.
- You will observe from these lists that test numbers have been assigned as follows:

Prestack Tests : Numbers 101 to 199

Post Stack Tests : Numbers 201 to 299

Post Migration Tests : Numbers 301 to 399

Prestack Test Number Assignments

PRESTACK TEST NUMBER ASSIGNMENTS

Test Number	Test Process
101	Raw data displays
102	Deterministic signature deconvolution
103	Statistical deconvolution
104	Temporal sampling rate
105	Prestack pre-filtering
106	Prestack amplitude recovery
107	Prestack noise removal (ZAP, RNA, for example)
108	Prestack asynchronous noise removal (rig, boat noise)
109	Prestack FK domain filtering
110	Prestack trace reduction
111	Surface consistent amplitude compensation (SCAC)
112	Transmission response amplitude compensation (TRAC)
113	Wave equation multiple attenuation (WEMA)
114	Tau P deconvolution

Post Stack Test Number Assignments

POST STACK TEST NUMBER ASSIGNMENTS

Test Number	Test Process
201	Raw data displays
202	Stack algorithm tests
203	Residual amplitude correction
204	Post stack FK domain filtering
205	FX deconvolution (RNA)
206	Deconvolution after stack (DAS)
207	Post stack interpolation
208	3D rotation
209	Post stack Q compensation
210	Spectral whitening
211	Post stack zero phase conversion
212	Post stack filtering
213	Radial predictive filtering
214	Post stack trace mixing
215	Post stack gain
216	Post stack AVO analysis
217	Synthetic data generation

Post Migration Test Number Assignments

POST MIGRATION TEST NUMBER ASSIGNMENTS

Test Number	Test Process
301	Raw data displays
302	Migration algorithm tests
303	Residual amplitude correction
304	Post migration FK domain filtering
305	FX deconvolution (RNA)
306	Deconvolution after migration (DAM)
307	Post migration interpolation
308	3D rotation
309	Post migration Q compensation
310	Spectral whitening
311	Post migration zero phase conversion
312	Post migration filtering
313	Radial predictive filtering
314	Post migration trace mixing
315	Post migration gain
316	Post migration AVO analysis
317	Synthetic data generation

Typical Test Log

Now let's see what a typical test log would look like.

Test Category : Raw Data Displays		
Test Number	Description Of Test	Date
1712-101-001	QC near trace display	01/01/2000
1712-101-002	QC near trace display; T(1.5) gain	01/01/2000
1712-101-003	QC shot gathers	01/01/2000
1712-101-004	QC shot gathers; T(1.5) gain	01/01/2000
1712-101-005	Amplitude Spectra; QC shot gathers (dB scale)	01/01/2000
1712-101-006	Amplitude Spectra; QC shot gathers (absolute scale)	01/01/2000

Test Category : Deterministic Signature Deconvolution		
Test Number	Description Of Test	Date
1712-102-001	A4 displays of deterministic signature deconvolution diagnostics	02/01/2000
1712-102-002	QC shot gathers; signature deconvolution, T(1.5) gain	02/01/2000
1712-102-003	QC shot gathers; signature deconvolution, resample to 4 msec, T(1.5) gain	02/01/2000
1712-102-004	QC NMO CMP gathers; T(1.5) gain, CMP sort, NMO	02/01/2000
1712-102-005	QC NMO CMP gathers; signature deconvolution, T(1.5) gain, CMP sort, NMO	02/01/2000
1712-102-006	NMO Stack; T(1.5) gain, CMP sort, NMO, stack	02/01/2000

Test Logs

- Hopefully the previous slide shows how easy it is to use the numbering system in order to assign test numbers to individual tests.